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Cost and Management

THE SOCIETY OF INDUSTRIAL & COST ACCOUNTANTS OF CANADA
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Journal of the Society of Industrial and Cost Accountants of Canada

COMING EVENTS - 1960

Executive Development Seminars

February 10-12	*London, Ontario*	**SELLING AND DISTRIBUTION COST CONTROL**
February 22-24	*Toronto, Ontario*	**FINANCIAL TOOLS FOR PROFIT CONTROL**
March 21-23	*Winnipeg, Manitoba*	**THE WHY AND HOW OF BUDGETING**
March 23-25	*Quebec City, Quebec*	**THE WHY AND HOW OF BUDGETING**
March 28-30	*Vancouver, British Columbia*	**COST REDUCTION AND COST CONTROL**
April 6-8	*Toronto, Ontario*	**MANAGERIAL CONTROLS**
May 9-11	*Montreal Ottawa*	**CAPITAL BUDGETING**

The 39th Annual Cost and Management Conference

June 27-29 *Queen Elizabeth Hotel*
Montreal, Quebec

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Editorial Comment . .

Perspective on 1959

TRADITIONALLY December is the month for reviewing the events and accomplishments of the past year. In the annals of the Society, this year will go down as the year in which a new service was born. We are referring of course to the S.I.C.A. Special Study series. Before the end of the year, the first number in this series will appear—a very complete study on "The Appraisal of Capital Expenditure" by C. G. Edge, B.Sc. Econ., F.S.S., F.I.S., R.I.A. Mr. Edge, who is Assistant Treasurer with Chemcell Limited, is a valued member of our Montreal Chapter and his work will be familiar to all faithful readers of *Cost and Management.*

In this study, Mr. Edge analyzes the skills necessary for examining the appraisal of capital expenditure, reviewing some of the older methods and explaining the newer concepts that relate the use of capital to the theory of interest. The formal procedures necessary to the capital appropriation request are covered thoroughly and, in the final chapter, Mr. Edge outlines the practical application of the methods he endorses.

The introduction of a new service is not just a matter of plunging ahead and getting something into print. It has taken months of careful research, planning and consideration by committees, staff and officers to determine where and how the available resources could be put to best use. It has entailed minute examination of all our services and the services of other business and accounting organizations in Canada and the United States. Many questions had to be asked: To what portion of our membership should the service be largely directed? What services would be new and valuable? Was there any duplication of our own or other services? We had to consider what the interests of the majority were and how much time members

had to take advantage of the service. Finally, the plans formulated by the Committee on Publications and Technical Services had to be approved by the Board of Directors. This approval was given last June and the stage was set to proceed with the mechanics of finding suitable material and putting it into the most attractive and readable form possible.

After considering a number of material sources, we found a gold mine of information within the Society itself. The theses in our library represent original contributions to accounting literature in nearly every specialist field and in many areas of general interest. We believe the best of these are comparable in scope and quality to any parallel publication now being printed. What is more, they deal with the specific problems with which we, as Canadians, have to cope. With meticulous editing, these should provide a unique and valuable source of reference material.

We think you will like the format in which they appear. With permanence, readability and convenience as the criteria, the studies will be uniformly and handsomely bound and printed, numbered for easy identification, and in all ways designed to be a credit to the businessman's library.

In other administrative areas the Society has continued to make headway during the year. The membership has increased to 8,222 from 7,412 at this time last year. The number of Registered Members graduated this year was 151 as against 92 the year before. The Executive Development Program saw its first year of expanded operations come to a successful close with a combined attendance of 285 in the eight centres in which the seminars were held. The National and Ontario Conferences held during the year were well attended and featured much-expanded technical programs. The Educational Foundation received the financial backing of the Provincial Societies to the extent of $8,000 and another $1,300 was received from industry. The revised course in Accounting II successfully weathered its first year of operation and this season the new Managerial Statistics course is being given by correspondence and lecture. Report Writing and Accounting III will be commenced in the new year. The Committee on Graduate Studies advanced to the stage of setting up a provisional curriculum for the proposed post-graduate course during the year and the Central Examining Board instituted several new improvements in examination marking and administrative procedure. This month the latest addition to the S.I.C.A. family, the Oshawa Chapter, marks its first anniversary.

All in all, it's been a busy and a good year for S.I.C.A. Lest we seem to be blowing our own horn too much, we say that none of this would be possible without the active and continued support of the membership. You have demanded progress, by your interest and enthusiasm you have sustained it, and through your services on various committees and advisory groups, you have supplied the guidance that we cannot do without. The warmest wishes of the directors, officers and staff go out to you and yours for a

Merry Christmas

and a

Happy and Prosperous New Year

DISTRIBUTION COST MEASUREMENT AND CONTROL

By S. D. Flinn,
Assistant to the President,
United States Steel Supply Division,
United States Steel Corporation,
Chicago, Illinois.

Setting up a practical and workable budget for its extensive warehousing operations was the problem in this company. In this article, the author tells how an effective budget was set up based on the use of standards and utilizing mechanical methods of data processing to the full. The system of control is described, including a novel method of controlling salesmen's time and travelling expenses.

FOR some years we have been attempting to set up a practical, workable and realistic budget for each of our steel warehouse operations located in principal cities from coast to coast. Through the lessons learned from experience, refinements have been made from year to year to develop a more effective means of measuring and controliing the cost of warehouse activities. These distribution costs comprise not only the actual costs of operating the warehouse itself, but the cost of operating a large sales force and office and administrative services for each warehouse in each geographical area. The first attempt to set up a profit plan was based largely on sales quotas allotted to each district, from which were derived the expected sales and gross profit. An estimate was made of the amount of each item of expense which could be incurred to arrive at a satisfactory net profit. Unfortunately, if sales slumped badly or if the sales estimates were greatly exceeded, the profit plan became meaningless as a basis for measuring the efficient operation of each district. Therefore, the idea of setting up a pre-determined budget based on anticipated volume of sales and corresponding expenses planned to produce a desired net profit was abandoned. It is entirely unrealistic because sales volume in the steel warehousing industry varies owing to causes quite beyond management control.

Next, sales quotas and related expenses on a normal volume basis were set up, with mechanics for adjusting expenses in relation to volume of sales actually experienced month by month. Some pretty good standards were developed by which the efficiency of warehouse operations could be measured and the proper expenditures at the varying business volumes could be determined. However, mechanics had not been developed to measure such things as proper product mix, proper dollar sales returns, proper gross profit rates, and proper sales and office expense rates in relation to various business volumes. Finally a formula was developed for determining the proper product mix, gross profit rate and spending rate at varying degrees of

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Mr. Flinn has held a number of responsible positions with United States Steel Corporation and United States Steel Supply Division which maintains and operates steel warehouses in principal American cities for the Corporation. Prior to his appointment as Assistant to the President, he was Comptroller of the Supply Division and has been Organization Planning Supervisor, Procedure Supervisor and Works Auditor for the Corporation. After graduating from the University of Pittsburgh, he spent ten years in the public accounting field. He is a past president of the Chicago Chapter and past national director of the National Association of Accountants.

operation, and a flexible budget related to actual sales volume could be applied. In effect the principles of a standard cost system were used to measure and evaluate performance at various sales volumes.

STANDARD COST SYSTEM HAS MANY USES

As mentioned before, acceptable standards had already been developed by the industrial engineers to cover warehouse expenses, so it was only a further step to develop a standard cost system. This standard cost system is designed to accomplish a number of purposes. It provides the means of measuring cost and operating performance and performance data and analysis of variances between standard and actual costs for each separate warehouse operation for effective cost control.

The various functions within each warehouse form the basis for individual cost centres. Thus all costs for each operation such as receiving and storing, friction-sawing, plate-shearing, assembling and shipping, etc. are separately accumulated. In addition to the accumulation of actual costs, basic standards for the operations within each cost centre have been developed in sufficient detail to measure accurately the time and cost that should be required for the individual orders processed each day. By summarizing the production within cost centres, and costing in terms of basic standards, the standard cost for separate cost centres is compared to the actual cost to measure operating performance. Variances from standard are analyzed in detail to determine their cause and then take appropriate corrective measures.

Additionally, the basic standards for each warehousing operation are in sufficient detail to provide a basis for planning and scheduling of operations. This planning and scheduling is, however, only done on an exception basis, as most of the orders received are processed and shipped within a period a 24 hours.

A second purpose for which the standard cost system is designed, is to provide accurate product and individual order cost information for measuring the relation of cost to sales prices, which guides the sales department in establishing sales prices. Within the steel warehousing industry the major item of cost is the purchase value of steel stocks carried in inventory for resale. This most important element of cost is recognized by costing the thousands of product items sold at standard current replacement inventory value. The use of standard values for material in inventory permits not only a proper basis for reporting gross profit by product groups, but also permits an analysis of the differences in actual prices paid for materials versus standard inventory values. These differences, by cause, will include purchases from non-standard sources, non-standard quantities, occasional purchases from competitors to meet customers' immediate requirements, excess costs of transferring inventories between warehouses and the like.

The cost system also provides for the flow of standard warehousing costs, by products sold, to measure the relation of those costs to prices charged for extra services. As a guide in establishing sales prices, the basic standards for warehousing operations are available for reference in analyzing the effect of order quantity and other considerations for each of the thousands of items carried in inventory for resale. The standards also may be used to calculate the profit or loss on individual orders.

The standard cost system is also designed to serve the needs of staff departments by providing the means for financial control, evaluation of facility planning, future

operations, and other services to management. For control, the cost system is tied in to the accounting records and is, therefore, verified by the accounting process.

Standards were likewise developed for measuring clerical work and sales expenditures. For many years a procedure staff has been a part of the accounting organization. In any multi-plant operation where there are large clerical forces involved, such a staff is a necessity and is the best guarantee for clerical cost control. Stated briefly, the functions of the procedure and methods group are: to survey existing procedures and clerical methods for improved efficiency; to design and install low cost clerical procedures and to set clerical performance standards. Procedure men are to clerical operations what industrial engineers are to production operations.

Clerical standards were set up many years ago, based on position descriptions, work flow, volume measurements, and proper work loads for each position. It was a rather simple task to adapt the standards which had already been established to the budget for district and general office expense. Flexible budgets for controlling sales expense at various volumes of sales were also developed.

HOW THE BUDGET IS DETERMINED

Now let's examine in more detail the method of making up the budget. This is accomplished through the use of various budgeted dollar sale and cost rates per an individual volume determinant. The term "determinant" can be defined as a unit of measure, the volume of which is largely instrumental in determining the dollar level of a particular revenue or cost item. For example, in the steel warehouse business "tons sold" is a unit of measure (determinant) by which sales and the adequacy of gross profit can be measured. This is done by multiplying the tons sold by a budgeted sales dollar rate to obtain the budgeted level of dollar sales volume. The budgeted sales dollar rate represents the normal revenue per ton of shipments with a normal product mix. Thus, the application of the sales rate to the actual volume of tons sold each month determines the dollar sales volume which should be obtained to ensure a reasonable gross profit. Certain warehouse operating expenses can be measured by "tons shipped" as a determinant.

District office activity depends almost solely on the number of orders handled. Therefore, number of orders processed or number of items invoiced represents an excellent determinant for measuring office expense. Certain other items of a fixed or semi-fixed nature can best be measured on a calendar month basis.

Warehouse operating expense items are measured by several determinants. Labor for unloading and stocking is measured by "tons received." Labor for assembling, zoning and loading, processing, service, and overtime premium are budgeted on the basis of "tons shipped." Superintendence is measured on a per month basis, as are inventory-taking, repairs and maintenance, and holiday and vacation provisions. Shift differential, social security taxes, pensions, group life insurance, and other fringe benefits are measured as a percentage of wages and salaries. Shipping and other operating supplies, processing supplies, power, light and water are measured on a "per ton shipped" basis. Fixtures and apparatus, plant protection service, fuel for heating, are measured on a "per month" basis, as are the fixed expenses of taxes, depreciation and rentals.

Office personnel is measured on a calendar month basis with the budget set at

varying rates depending on number of items invoiced. Other office expense, such as stationery, postage, telephone and telegraph, are also measured by the number of items invoiced. Office space rentals, property taxes, depreciation, etc. are budgeted on a "calendar month" basis.

Sales expenses are budgeted as follows: Outside salesmen and their travel and entértainment expenses are measured on a "per ton" basis with the budget set at varying rates depending on the number of tons shipped. Advertising expense, direct mail expense, catalogue provisions and the like are budgeted on a "calendar month" basis.

CONTROLLING SALES FORCE ACTIVITIES

One of the areas in which it is most difficult to control distribution expenses is that of salesmen's time and travelling expenses. Where a large sales force exists, it is most important that some form of cost control be attempted. Management, both in the districts and at the general offices, must have adequate information, with a minimum amount of detailed effort on the part of salesmen and sales supervisors, to determine whether salesmen's calls are effective and result in good penetration of the market with the greatest number of accounts.

The system of control starts with what is called a consumer data form which is prepared by salesmen upon interviewing each customer. This form records the name and location of the customer, the individual to contact, with information about his interests, outside activities, etc. which might give the salesman a basis for approach or conversation with him. It shows the type of business or products produced by the customer. It indicates the frequency with which the salesmen should call on the customer, the products he should buy, and the average quarterly requirements of each. Using the consumer data forms as a guide, the salesmen plan their program each quarter for what is called "target accounts." These accounts are not the complete list of customers in each territory, but they are the accounts to whom each salesman intends to sell between 80% and 90% of his tonnage. The salesman plans the number of calls he will make and the tonnage he expects to sell, account by account and product by product, in order to obtain the tonnage set as his quota by sales management. After each salesman has his over-all program prepared he plans his weekly activities in advance, to accomplish his goals. The consumer data form shows the dates of previous calls on each customer and the tonnage sold on each call. Using this data he is able to lay out all the calls he intends to make the following calendar week.

The next step in salesmen calls control is somewhat unique. As each salesman calls on a customer he reports the results of that call by mark-sensing a tabulating card. This report card indicates whether the call made was on a customer—which is any account regularly sold; a prospect—which is any account solicited but not buying; or a new account—which is any account never contacted before. The card also indicates whether a call has been made but without contact because the buyer was not in or not available. The salesman indicates whether he took the buyer to lunch or dinner, or extended any other type of entertainment; the latter type of entertainment is explained on the reverse side of he card. The salesman indicates the result of his call, showing each product discussed, whether it was a check-up

call on a good customer, a call to investigate a claim or other business. The outcome of the call is indicated as to whether an order has been received, a promise of order or inquiry has been given, reasons for non-receipt of an order such as "buyer can get quicker service from other sources", "receives better credit terms elsewhere", "lost order because we are out of stock", or "the account has close business or personal ties with a competitor", "receives a better price elsewhere", "customer no longer has need for our product", or any other reason for not buying is indicated. The salesman also indicates the total time spent in the office of the account, broken down into waiting time, actual interview time, time spent in the customer's plant, or other contact duties.

These mark-sensed tabulating cards are forwarded to the tabulating department in the general office where the information is tabulated. They give a great variety of data and almost complete information on how the salesmen spend their time, with less effort than the usual longhand reports required of salesmen. Tabulations of all salesmen's reports also give most unusual statistics concerning the effort and time involved in obtaining orders by the entire force of salesmen. Not only is the use of tabulating cards for reporting salesmen's calls most unusual, but it is quite inexpensive. It costs about three dollars per month per salesmen to control expenses of $1,200 to $1,500 per month per salesman.

IDP UTILIZED FULLY

Practically all of our accounting data are recorded and processed on the basis of integrated data processing. As you know, the concept of integrated data processing is that data will be recorded at their point of origin and transmitted and processed from that point on automatically. Since, in a warehousing business, sales are the most important activity, much of the accounting and statistical data originate directly from the customer's order.

When customer orders are received at the district offices they are recorded on flexowriters. The repetitive information, such as customer's name and address, terms, delivery, routing and product description, is recorded automatically by the insertion of edge-punched cards into the flexowriters, it being necessary to type manually only the non-repetitive data such as quantity and the like. A punched tape is automatically produced, recording order information which at the end of the day is transmitted to our general office tabulating department by teletype. Tabulating cards are then produced from the tapes by tape to card machines. Each district also reports each day the orders shipped, and the necessary quantity information is manually punched into the cards previously prepared from the order tape. These cards are then processed through the electronic computer which identifies and selects the proper price for each product, calculates the value and punches it in the cards. The cards are then tabulated on the printer, producing a customer invoice for each order.

From these same cards, accounts receivable records which, in turn, are on tab, are obtained as well as our sales statistics reports. Our accounts payable are also on tab, from which are obtained charges to inventory and capital accounts and expense distribution. Accordingly, all accounting statements are prepared automatically from these basic tab card decks.

CONCLUSION

With the availability of electronic machines, there is no need to limit our thinking to accounting applications, valuable as these may be. Their application to office and management functions is unlimited.

It involves sales, production, transportation and traffic, treasury, purchasing, and by no means the least of the fields of application, engineering. Then, too, the broader field of developing the area of management decision and policy is entirely within the possibilities of these machines. Truly, there are fantastic possibilities and an entirely new vista of accomplishment as a result of the adaption of electronics to the office.

For further reading

MEASURING AND CONTROLLING DISTRIBUTION COSTS, by H. E. Gannon, N.A.C.A. Bulletin, March 1955.

DISTRIBUTION COST CONTROL, by Donald A. Gaudion, the Controller, March 1955.

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TOPICAL comments

LOOKING AHEAD

Airborne education seems to be fast approaching. A research group of educators in the U.S. is experimenting with high-flying airplanes doing TV broadcasts. The purpose is to reach more schools at a much reduced cost. The research is sponsored by foundation grants and is expected to cover an audience of 5 million students and 13,000 schools and colleges.

An electric tractor has been developed. It is powered by a fuel cell which makes electricity by direct chemical reaction on propane gas. There is much speculation as to if and when the fuel cells will be available as a means of powering transportation and home appliances now using conventional electric motors and internal combustion engines.

The expanding world markets will likely result in a large increase in North American investment in foreign countries. This investment will be in the form of plant facilities that will take advanage of lower manufacturing costs. This will make selling prices competitive with other firms established in the same area.

ON THE PERSONAL SIDE

The American tourist will be better able to make use of duty free $200 take-back quota for a 48-hour Canadian visit. An international syndicate has started two duty free shops at key border points to exploit an expected $6 million business in 1962. Other similar shops are in the planning stage.

The old red school house may soon be replaced by the plastic look. The desirable features are sectional design for easy convertibility or even easy mobility.

The smoke you puff contains 4,000 distinct materials. So says the top executive of a tobacco company. No wonder the effects are subject to such divergent opinions.

Migraine headaches are a major cause of lost time and accidents in industry. One large Canadian firm estimates this cause to be responsible for about one-quarter of all time lost by illness.

A Canadian dentist has reported the first successful transfer of teeth from one person to another. It looks like another branch bank will be started for a part of the human anatomy.

A new energy-absorbing car bumper that is disposable has been developed. Besides the added safety factor, this could reduce the number of domestic flare-ups after milady has spent the day shopping downtown.

OF GENERAL INTEREST

Statistics can be confusing. From August to September there was a decline in employment by 108,000, but at the same time there was a decline in unemployment

by 26,000, a part of the reason being fewer outside jobs available and at the same time a return-to-school movement.

Even with the effects of the steel strike there were more people employed in the U.S. in September than in any previous year for this month.

In a survey of companies preparing for the future, it is reported that paperwork is growing faster than sales. Where this is happening:

small companies	— 36%
medium sized	— 45%
large companies	— 39%
very large companies	— 38%

The survey also showed that in replacing office equipment the decision was based primarily on these motives:

to improve operating areas	— 36%
to provide management with better information	— 32%
to reduce clerical cost	— 32%

The tire market is becoming even more competitive, not only between the manufacturers, but also between the producers of the basic materials. The nylon manufacturers are out to replace rayon cord as standard equipment on new cars. They have already made significant inroads on the option equipment and in the replacement business. Price differential is steadily decreasing.

Self-insurance in the form of executive flying restrictions is practised by 60% of companies covered in a recent survey. These companies placed limitations on the ranks and number of executives flying together. Only 10% of the companies had the restrictions in writing. There are many differences between companies as to who the restrictions should cover and the method used to enforce them.

Nylon Tanker has been used successfully off the coast of England. The latest in liquid transportation by sea is apparently past the experimental stages.

The new tanker (10,000 gal. size) is basically a nylon bag, elongated in shape, lined with a petroleum-resistant synthetic rubber and coated on the exterior with Neoprene. It fills in 15 minutes by gravity and a portable pumping unit can empty it in one hour. It can be collapsed and rolled up for easy transportation. It is pulled behind a tug and because of its cigar shape and low profile, slips through the water easily.

It should have some considerable application (cost $28,000.) for use on inland and coastal waterways where short, economic, low-tonnage hauls are necessary.

J. EDGAR DION

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DECENTRALIZING PLANT ACCOUNTING

By Peter Berghian,
General Supervisor, Field Acounting,
Indiana Harbor Works, Inland Steel Company,
East Chicago, Indiana.

This company found decentralization of the accounting function was best suited to the operations of its multi-department plant. The plan adopted brought many advantages in the areas of production accounting, incentive computations, inventory reporting, and staff service functions. This article outlines the objectives of the decentralization program, the way in which it was put into operation, and the results obtained.

IT IS the intention of this paper to outline the relative advantages of decentralizing the accounting functions of a multi-department plant covering a large area and to relate some actual experiences in converting to a decentralized plan.

Ours is a fully-integrated steel plant comprised of the following producing departments: blast furnaces, coke plant, open hearths, blooming, slabbing and billet mills, bar and shape rolling mills, hot strip mills, cold strip mills, tin mills, continuous galvanizing mills, plate mill, and rail accessories, plus all the necessary service and operating service departments.

For our purposes, centralization means the consolidation of all accounting functions—beyond the origination of source data—in one location.

Decentralization would therefore mean performing the accounting functions in the operating area where accounting personnel can take an active part in the processing and control of the original data.

In either situation, we would assume direct line responsibility within the accounting organization, the principal difference between the two situations being only the location of accounting personnel.

There are, of course, certain inherent advantages in either form of organization.

CENTRALIZATION VERSUS DECENTRALIZATION

Some advantages that would naturally accrue to any centralized organization would be closer supervision of personnel, easier cross-training of personnel, shorter lines of communication, greater flexibility in shifting work loads, more efficient maintenance of supplies, closer control over dissemination of information, possible savings in office machines, equipment, employee facilities, and office space.

Some advantages which are naturally related to decentralization are closer control over source data, shorter lines of communication to the operating department, elimination of duplicate record keeping, opportunity to gain more intimate knowledge of operating techniques and problems, better environment for supervisory development, and greater opportunity to render service to the operating department.

After studying the relative advantages of centralization and decentralization and taking into consideration the specific advantages to be gained in the areas of pro-

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Peter Berghian joined Inland Steel Company in 1933, serving in various accounting and traffic department positions. In 1953 he was appointed General Supervisor, Field Accounting, of the Indiana Harbor Works, a position which he still holds. Mr. Berghian is a member of the Calumet Chapter of the National Association of Accountants.

duction accounting, incentive computations, inventory reporting, and staff service functions to the operating department heads, it was decided that decentralized accounting would best suit our purposes.

OBJECTIVES OF THE DECENTRALIZATION PROGRAM

Once the concept of decentralized accounting was adopted by works management, the process was begun on a gradual basis, one department at a time, with the following general objectives in mind:

1. To develop standardized procedures for reporting and recording production and material consumption, and for maintenance of inventory control records.

   The establishment of a uniform pattern throughout all like areas would result in more consistent accounting. Such standardization was not obtainable prior to this time because the control of reporting and recording was under the direction of the particular department involved and the lowest common level of supervision was the plant general manager.

   One of the immediate gains in the area of this objective was the standardization or reporting forms. In one instance some 35 different reports per turn were consolidated into a maximum of three per turn. In other instances, uniform reporting was initiated for similar operations which produced comparable end products.

   To improve inventory control, records were established so that a production item (slab, coil, billet, etc.) would be credited from an inventory at the same weight at which it was originally charged to the inventory. Prior to the advent of field accounting under central guidance this was not always the case.

2. To prepare daily and monthly statistics of product yield and production costs.

   Here, again, it was our objective to develop yield statistics on a uniform and consistent basis. In some cases, where reported by other than accounting personnel, the data were not being computed on a uniform basis.

   Production costs were to be reported directly to the operating department heads far more rapidly than had been possible in the past.

3. To prepare the necessary information for product cost allocation and to coordinate such requirements with the reporting and recording procedures in order to reduce clerical effort and eliminate duplication.

   Prior to this time, the summarization and reporting of production data, material consumption, preparation of control records, and much of the product cost allocation data were being done by non-accounting personnel. In most areas, operating personnel were also maintaining duplicate summaries of production data, etc., for their ready reference.

4. To calculate incentive bonus and payroll information and to develop labor cost distribution.

   In some areas, the calculation of incentives was being done by other than accounting personnel. In many areas the labor cost distribution data were not as accurate as they should have been and the interpretation of the basic data which was being submitted for incentive purposes was also occasionally found to be in error. In both cases lack of accuracy and legibility was a recurring problem.

5. To develop departmental budget control information and assist in the preparation of periodic control reports.

   Decentralized accounting would permit more intimate and constant contact with the operating department on budgetary matters and would serve to bring the required data into sharper focus, ultimately giving a better budget.

6. To assist the various levels of operating management through preparation of daily operating reports, cost analyses, and special reports of an accounting nature.

   The intention here was to give on-the-spot-service to the operating department head and to serve him in a staff capacity so that better information could be provided to him more rapidly than before.

7. To relieve the operating department head of the responsibility for processing data for accounting purposes.

   While not the primary objective, placement of those responsibilities under accounting also naturally resulted in better reporting than before.

PLANNING THE DECENTRALIZATION PROGRAM

Decentralization of production and cost accounting began in 1953.

The decentralized accounting offices are called "field accounting offices" and each is suffixed by the name of the departments serviced. Each office is headed by a supervisor who reports to a general supervisor who in turn reports to the assistant manager, production and cost division of works accounting.

The establishment of the field accounting offices meant the re-alignment of functions and the re-orientation of many people who had been operating under their familiar practices for a long period of time. Such re-alignment and re-orientation could obviously not be accomplished without diplomacy, finesse, and much hard work in the form of meetings and discussions in order to reach a clear understanding of the basic purposes of decentralized accounting.

Meetings between accounting and operating department management were set up as the first step in the transition. At these meetings, the purposes of decentralized accounting and the objectives which we hoped to attain were reviewed and explained in detail. *All* of the intended advantages were discussed, not just those pertaining to accounting itself, but the benefits to be derived from the operating and the company standpoint as well.

At this first meeting arrangements were made for subsequent reviews of the functions which were being carried out in the departmental offices.

During the course of the surveys, most of the clerical personnel in the departmental offices were interviewed and a job analysis was prepared for each clerical function.

These job analyses were then discussed with the departmental clerical supervisor and in some cases with the general foreman in the area. The job analyses were then studied carefully to determine exactly what functions were accounting in nature and which were operating.

A formal report for the whole operating division was then prepared on the basis of these analyses. This was presented to operating management as an initial phase in the bargaining process which was inevitably involved since there were overlapping functions in most cases.

After reaching agreement on the functions which were to be retained by the operating department and those which would be transferred to the field accounting office, it was then necessary to evaluate each individual concerned and to re-align his job functions.

At the same time, office space arrangements were agreed upon and furniture and equipment were transferred as required. In most cases space was provided as close as possible to operating management offices.

After it was decided which personnel to transfer from the operating department to the accounting department, operating management discussed the transfers with the people involved so that they would be fully aware of the situation. These transfers in no way hindered their promotion in the operating sequence but opened up the accounting field to them also.

Each individual was further given the opportunity to discuss the matter with either operating or accounting supervision, or both, in order to assure himself that he was making the proper decision.

While it would be obviously untrue to claim 100% co-operation, correct decision on personnel, and smooth transition of functions, the relatively few changes which were required subsequently in either function or personnel indicate to us that the thoroughness of our original approach and the time spent in the initial evaluations really paid off.

In certain areas where insufficient records were being maintained or where it was felt there would be substantial gain if additional services could be performed for the department head, the necessary approvals were obtained and increases in force were made. Because duplication of effort was eliminated, increases in force were relatively few.

Upon completion of the transfer agreements, the official bulletins were issued, the transfers were formalized under accounting supervision, and the field accounting sections were established.

RESULTS OF THE PROGRAM

We have now had some five years experience with our decentralized field accounting installation. We feel that we have attained our original objectives in full measure.

Production reporting, material consumption data, inventory control records have all been improved.

Product yield and production cost data are being prepared uniformly and consistently.

We feel that we have improved our product cost allocation and that our labor cost distributions are much improved.

The experience with our departmental budget control program has been strengthened and our efforts at servicing the operating department heads in a staff capacity have been helpful to both accounting and operating functions.

The location of accounting representatives in producing departments has resulted in better reporting through better appreciation of producing department techniques and problems. The experience we have had in our hot strip mills will serve as a good example.

Our accounting personnel were able to acquaint operating personnel and manage-

ment with good accounting principles and techniques. Finer cost control was set up within the department to assist them in controlling their operating costs. As an example, in the Hot Strip Mill all costs had formerly been accumulated into three cost centres.

Those cost centres were:

1. Hot Strip Mill (rolling). This cost centre was used to accumulate all of the costs of heating furnaces, roll stands, run-out tables, shears, and coilers. The costs accumulated in the cost centre included processing costs and material practice.

   (In our terminology processing cost includes all indirect and direct labor, repairs and maintenance, operating expenses, operating supplies, fuel, and any other expenses inherent in the operation of the unit.

   Material practice in our terminology represents the cost of the material charged to the unit, less credit for scrap recovery.)
2. Hot Strip Sheet Finishing. This cost centre included all units which processed material in coil or cut length form. Here again the cost statements showed both material practice and processing cost. Except for repairs and maintenance, which were reported by processing units, all other items of processing cost were reported in total and covered all processing units included in the Finishing End.

   In the same manner, material practice was shown as a total and was not detailed by processing unit.
3. Hot Strip Plate Finishing. Reporting for this cost centre paralleled that described as the Hot Strip Sheet Finishing.

In order to establish a more direct control of costs, the presentation of cost details for these three cost centres was reviewed with operating management. As a result of this review the following functional cost centres were established:

1. Superintendent's Office. This cost centre is charged with all costs of maintaining the office and staff. The expense accumulated in this cost centre is distributed monthly to all other Hot Strip Mill cost centres where it is shown as a separate line item.
2. Rolling and processing units.
   A. Heating and rolling
   B. Finishing—Decoiler and shearing unit
   C. Finishing—Skin Mills
   D. Finishing—Slitters and side and end shears
   E. Finishing—Ungerer Leveller
   F. Finishing—Bench inspection
   G. Finishing—Slitters and levellers
   H. Finishing—Plate shearing
   I. Finishing—Plate oiler
   J. Finishing—Resquare shears
   K. Bundling, Loading, and Shipping.

Under this revised display, each of the cost centres now carries a detailed listing of the processing cost items. In addition to this, a Hot Strip Finishing Summary Statement is prepared which combines all of the finishing costs in

one statement.

It can be readily seen that this method of costing would give the operating man much better control than he has had before.

3. Auxiliary cost centres were also established as follows:

A. Hot Strip Mill Finishing—General Supervision and Maintenance.

This cost centre was established to accumulate the charges of general supervision and maintenance where such costs were common to all areas of the Hot Strip Mill, excluding those costs which were applicable to the superintendent's office.

The expenses of this cost centre are also distributed monthly to the various processing cost centres upon whose cost statements they appear as line items.

B. Hot Strip Mill Finishing—Cranes, Tractors, Other Material Handling.

This cost centre is charged with all costs of operating and maintaining cranes, tractors, and other material handling equipment. The expenses of this cost centre are also distributed monthly to the applicable cost centre and appear as line items on their processing cost statements.

Because sufficient weighing facilities after each processing unit were not available, material practice on the above-mentioned cost centres was not established immediately. We are anticipating this move in the very near future. As scales are made available, plans are made to institute the recording of material practice on each processing unit.

BETTER CONTROL METHODS ESTABLISHED

Paralleling the establishment of the reporting method for detailing processing cost by operating unit, a comprehensive training program was instituted by field accounting personnel in the area. Discussions were held with general foremen and turn foremen to acquaint them with operating costs and to instruct them in the utilization of the cost report as a control tool.

During the discussions some of the points covered were:

The general classification of operating and administrative expense.

Definitions and examples of fixed, variable, and semi-variable expenses with graphic illustrations of the inter-relationship and the effect of each type of expense upon the total cost of the unit.

Definitions and examples of processing cost, manufacturing cost, conversion cost, and other similar terms.

Processing cost statements and each element of cost were reviewed in detail with illustrations of the results of effective control.

The cost effect of improved yield was graphically illustrated and the changes in processing costs which were brought about by changing yields were discussed.

As a result of this program the foremen's interests were aroused and they began to pay more attention to cost reports and to work much more closely with field accounting supervision in an endeavour to control and lower costs in their respective areas.

In order to capitalize upon the results of the training program and the interest which it aroused, monthly cost comments are prepared on a routine basis by the field accounting supervisors. These comments show the increases or decreases in

costs from month-to-month and are distributed to all levels of departmental operating management. Follow-up meetings are then held at which time the cost comments are discussed and the reasons for the changes in cost are analyzed.

Improved methods of inventory control were also established for semi-finished and finished products. In all areas where semi-finished inventories are processed, operating personnel utilize the accounting records for production control purposes.

A good example for improved control is the formalized "Ingot Inventory Control Procedure."

Prior to the establishment of this procedure, inventory records were maintained by the various departments—including accounting—with no specific assignments for responsibility of overall control.

Under the new procedure, one person maintains complete detailed reports covering production, disposition, and location of all ingots.

The improved control procedure is as follows:

The open hearth prepares a production report for each heat, listing the number of ingots, mold size, specification, and weight of individual ingot.

This report is the basis for the recording of open hearth production, by furnace, and the subsequent charging of the ingot inventory account.

Each blooming mill prepares a pit-charging report which lists heat numbers, steel specifications, size, number of ingots made, charged, stocked, and the number of stickers. The above data are reported by pit number. (A "pit" is a large refractory-lined receptacle in which many multi-ton steel ingots are heated to temperatures in excess of 2,000°F. prior to further processing.) The report also shows the time ingots were charged (put into the pits), and drawn (removed from the pits for rolling). This report is the basis for relieving the inventory.

From these two source documents, the ingot inventory control clerk develops the "Hot Ingot Inventory Control Report."

The Hot Ingot Inventory Control Report shows the date, heat number, number of ingots produced, the weight per ingot and weigh per heat, and the disposition of ingots produced. The disposition columns show which blooming mill consumed the ingot—or if not consumed shows it as a sticker or reports where it was stocked. Both number of ingots and weight are recorded under the disposition. (A sticker is an ingot which cannot be removed from the mold in the normal manner. It is usually necessary to break the mold, but on occasion stickers may be forced from the mold without requiring its destruction.)

The Ingot Inventory Control Report is cross-footed daily and a summary of the tons of ingots produced by the open hearth shops and the tons consumed by the blooming mill is recorded.

Wherever ingots have not been charged into a bloming mill, the "stock" or the "sticker" columns of the report are utilized. In this case detailed inventory cards are prepared for each heat.

This card establishes the control of ingots by location.

Whenever stock ingots are moved from one location to another an ingot shipping memo is prepared by the shipper.

The ingot shipping memo then becomes a source document for recording transfers of ingots between locations.

By means of this system the ingot inventory control clerk can, at any tu furnish all required data regarding the availability and location of all stocked ingots.

SUMMARY

In summary, we feel that we have obtained the following benefits from our field accounting organiztion:

Performing the accounting function at the source has eliminated the necessity for duplicate record keeping in both the accounting and the operating departments. We now have only one record of production with that under the jurisdiction of the accounting department but available for reference by the operating management.

The proximity of accounting to operating units has resulted in improved control over source data. Responsibility for accumulation and end use has been combined and that, coupled with the technical training of the accountant, has enhanced control. Advantages have also accrued from the fact that errors are discovered immediately and can be traced to the source and resolved on the spot.

Operating management has been relieved of accounting responsibilities and can devote full time to operating problems.

Closer contact between operating and accounting personnel has resulted in a greater mutual appreciation of problems and has aided in understanding.

As a result of the day-to-day contact, operating personnel have also been prompted to turn more readily to accounting for assistance in those areas where accounting is best equipped to render service.

Accounting personnel have gained more intimate knowledge of the plant operations and have therefore been better prepared to report upon those operations through proper recording techniques because they do not have to operate from "remote control" as had formerly been the case.

We are continuing our efforts and progress is being made in expediting reports to management and in furnishing them with more detailed data, as required.

Machine accounting has been utilized to develop more detailed information, not only for production reporting but from the standpoint of rolling data, average gauge, average width, and similar operating statistical data. All of these improvements have benefited operating management from a control standpoint and have provided more accurate and detailed product cost. The end result of such improvements will also be obviously beneficial to our sales department as well.

For further reading

HOW MUCH CENTRALIZATION OR DECENTRALIZATION OF THE ACCOUNTING FUNCTION? by Robert A. Morgan, N.A.A. Bulletin, Sept. 1957.

DECENTRALIZING ACCOUNTING DIVISIONS, by A. H. Seed, N.A.C.A. Bulletin, Aug. 1955.

DECENTRALIZED OPERATIONS—A CONTROL PROGRAM, by William L. Strong, The Controller, Jan. 1958.

CONTROL OF DECENTRALIZED ACCOUNTING IN A MULTI-PLANT ORGANIZATION, by C. M. Blumenschein, The Controller, Feb. 1953.

The Economic SCENE . . .

by W. Allan Beckett

THE CANADIAN ECONOMY IN 1959

GENERAL TRENDS

AS 1959 draws to a close, we are reminded that this is not just the end of another year. It is the end of a decade. One wonders, too, whether it also marks the close of an era.

Canadian business was prosperous in 1959, as indeed it has been for the past fifteen years generally. What kind of prosperity has it been? Just where do we stand as we pass into the new decade ahead? This month, the *Economic Scene* reviews economic developments of the past year. Next month, we shall attempt a forecast of 1960 and the years ahead.

As predicted in the *Economic Scene* (January, 1959) the slope of general business activity in Canada has been gently upwards throughout 1959. The total flow of goods and services as measured by the Gross National Product is expected to total $34.9 billion, a shade above the earlier forecast.

DEMAND

As mentioned in the mid-year review (July-August, 1959) the increased demand stemmed initially from consumer buying and from business spending to replenish inventories. By the second quarter of the year, business fixed capital formation turned up, with increases in private spending for new plant and equipment more than offsetting declines in new residential construction. Recent indications, monthly contracts awarded for new building, and new orders placed for machinery and equipment, suggest that the rise in this sector continued to the year end. Total work put in place will likely exceed the Private and Public Investment Intentions by about 4%, bringing the increase to about $225 million over 1958.

Government spending continued to rise throughout the year with the growth being most pronounced at the provincial and municipal level.

Foreign demand for Canadian products quickened as the year progressed, with the temporary settlement of the steel dispute adding strongly to exports in the final quarter. Imports also rose, reflecting both the strength of consumer demand and the revival in machinery and equipment expenditures. The contributions of the various demand sectors to total production are detailed in the following table.

GROSS NATIONAL EXPENDITURE

millions of dollars

	1958	1959 mid-year	1959 indicated annual rate	change 1958 to 1959
Consumer Expenditure	21,012	22,092	22,171	+1,159
Government Expenditure	6,150	6,588	6,500	+350
Business Capital Formation	6,899	6,960	7,128	+229
Housing	1,762	1,616	—	—
Non-Residential	2,813	2,864	—	—
Machinery & Equipment	2,324	2,480	—	—
Inventory Change	−424	+272	+240	+664
Exports	6,289	6,704	6,750	+411
Imports	−7,361	−7,912	−7,850	−439
Error	−56	+8	—	+56
G.N.P.	32,509	34,712	34,939	2,430

SUPPLY

The increases in final demand brought forth enlarged production and employment. Industrial production will have registered a gain of about 7% from 1958, ending the year near the 170 level compared to 153 in 1958, and the recession low month of 149, December 1957. The index is based on 1949=100. Industrial employment rose more slowly to recover about 3% from its low of 1958. The percentage unemployed, which had reached 7.2% in June 1958, and averaged 6.8 last year, fell to near 5% by the year-end, still somewhat short of the full employment mark.

Labour income, reflecting a moderate advance in hours of work, and wage rates, as well as the growth in employment, rose by about 7%, the same increase as in the Gross National Product.

Corporate profits had surpassed the previous 1956 peak by the second quarter of the year and are expected to have revealed continuous growth to the year end. The increase in business profits, which always move up and down sharply with the business cycle, is likely to exceed 20% for the year as a whole. Investment income mirrored the higher interest rates, while returns to non-corporate business rose with business volume. The out-turn of farm income is still uncertain at this stage, but a marginal increase seems to be indicated.

Government collections of indirect taxes rose with the final volume of sales and higher tax rates. Capital consumption allowances grew in line with the higher stock of capital and increased replacement costs.

PRICES

Most of the rise in business activity represented a real increase, as prices in general advanced moderately. The general wholesale price index moved ahead barely one per cent, although basic industrial commodities showed a slightly stronger advance. Consumer prices only inched forward during the year and wound up less than one per cent higher than 1958. Much of this growth represented lower levels earlier in 1958. Interest rates touched new peaks at mid-summer, but tapered off seasonally toward the year-end. The prices of industrial common stocks experienced difficulty in piercing their 1957 highs, but the year end rally that is still to come may witness a break through in an upward direction.

SUMMARY

In general, 1959 was a typical year of business expansion. Physical production advanced without serious pressure on the available stock of capital or the labor supply. Price pressures were moderate and the speculative excesses which it was feared might have developed earlier did not materialize, except for a limited time in the short-term money market.

These trends are in healthy contrast to the early waves of prosperity—1947-1949, 1950-1953, and 1955-1957, each of which was accomplished by price inflation.

Two interpretations are possible. One, we may be approaching the culmination of a long period of prosperity, in which individual expansions can be expected to be less hectic. Two, the anti-inflation policies of government and business may have had more impact in a year of saner growth.

At any rate, at the year end, the leading indicators of business activity point toward a continuation of this moderate prosperity, although it is too soon to tell whether it will carry us all the way through 1960.

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BASIC COST ACCOUNTING SYSTEM FOR GRAY IRON FOUNDRIES*

By James R. Matteson,
Comptroller,
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In this article, the author outlines a very simple job cost system for gray iron foundries that should be at least a basic requirement for this type of operation. It supplies a practical and workable system that is easy to understand, to set up, and to use at a nominal clerical cost.

GENERAL OUTLINE OF JOB COST SYSTEM

IN THIS basic cost accounting system each main department of the foundry is treated like a separate business enterprise. These main departments are:

(1) Melting department.
(2) Molding department.
(3) Core making department.
(4) Cleaning and shipping department.

All expenses that obviously belong to a department are charged directly to it. However, some expenses do not belong specifically to any department and, as such, are distributed at the end of the accounting period to the four main departments so that each will include its fair share of these expenses in the total cost of departmental operation.

When a foundry knows the total cost of operation of each department, it becomes possible to determine the cost of individual jobs in each department.

If the cost records show that the cost of melted metal is four cents per pound of good castings produced, the cost of melted metal of any job can be found by multiplying its weight by four cents.

Assuming the cost records indicate that the total molding overhead cost is 200% of total molding direct labor cost, then the total molding cost of any job can be determined by adding 200% to its molding direct labor cost, which can be calculated by obtaining the actual molding time on the job.

The total core cost of any job can be determined in the same way as the total molding cost by adding the proper overhead percentage to its core direct labor cost.

If the cost records show that the average cost of cleaning and shipping is two cents per pound, a simple way to determine the approximate cleaning and shipping cost of any job is to multiply its weight by two cents.

By adding these four departmental costs together, you get the total cost of the job. It's just as easy as that.

*Condensation of a thesis submitted for R.I.A. qualification

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Some foundrymen do not realize that an adequate cost system can be installed and maintained at a very reasonable clerical expense. This basic cost system calls for only four main departments and a minimum number of cost accounts, yet gives satisfactory job costs.

The fundamental principle of this cost system is the foundation for all cost programs, large or small. A good cost system is a "must" for every foundry regardless of its size. Once installed, this system can be expanded progressively to meet special cost requirements or to obtain more detailed cost information.

EXPLANATION OF CLASSIFICATION OF COST ACCOUNTS

This classification includes only the minimum number of cost accounts required to obtain accurate job costs. Any foundry that desires a more detailed breakdown may carry as many additional cost accounts as desired. In the numbering system, the first digit indicates the department. Thus accounts in the 100 series are all melting department accounts. In the departmental account numbers, the second and third digits indicate the nature of the accounts. Numbers 0 to 99 are reserved for asset and liability accounts and are not detailed here as they are similar in every business and do not relate to the topic selection.

The accounts in this classification (Exhibit 1) are all expense accounts. It is expected that every foundry will already have a set of ordinary bookkeeping accounts, which will consist of asset, liability, income and expense accounts. When this basic cost accounting system is adopted, it is expected that the old asset, liability, and income accounts will be retained, but the old expense accounts will be superseded by the accounts listed in this classification, plus any additional expense accounts that may be required or desired.

GENERAL DISTRIBUTION PROCEDURE

The bookkeeping procedure involved in preparing complete departmental cost statements in accordance with this cost system for any accounting period consists of four steps, as follows:

(1) The routine collection of cost data during the period, which represents principally the distribution of purchases and the distribution of the payroll.
(2) The preparation of a preliminary statement at the end of the period showing the total cost for the period of all the accounts listed in Exhibit 1.
(3) The distribution at the end of the period of all general overhead expense on the above statement to the four productive departments.
(4) The preparation of a final statement which shows the total cost of each department, including its share of the general overhead expenses.

In the following pages each of the above steps is explained fully.

DISTRIBUTION OF PURCHASES

The customary method of distributing purchases is to use a columnar purchase journal.

Purchase journal sheets may be designed to include as many additional columns as the user may desire, but in most small foundries it will be sufficient to have special columns for the main departments and a sundry column.

In the case of items which are used by one department only, it will be very easy to determine the column in which they should be entered. There will, however, be

EXHIBIT 1

CLASSIFICATION OF COST ACCOUNTS

Department	*Account No.*	*Title of Account*
No. 1, Melting	100	Metal.
	120	Labor.
	130	Supplies and expense.
	131	Coke.
	140	Foremen and clerks.
	150	Repairs.
No. 2, Molding	210	Direct labor.
	220	Indirect labor.
	230	Supplies and expense.
	240	Foremen and clerks.
	250	Repairs.
	260	Pattern and flask labor expense.
No. 3, Core making	310	Direct labor.
	320	Indirect labor.
	330	Supplies and expense.
	340	Foremen and clerks.
	350	Repairs.
No. 4, Cleaning and shipping	420	Indirect labor.
	430	Supplies and expense.
	440	Foremen and clerks.
	450	Repairs.
No. 5, General overhead	500	Power and light.
	501	Depreciation, equipment.
	502	Depreciation, buildings.
	503	Taxes.
	504	Fire insurance.
	505	Heat.
	506	General repairs.
	507	General supervision.
	508	Payroll taxes.
	509	Workmen's compensation insurance
	510	Vacation and paid holidays.
	518	General foundry labor.
	519	General foundry expense.
	550	Administrative and selling salaries.
	551	Administrative and selling expense
No. 6, Extra costs	600	Returns and allowances.
	601	Freight and express out.
	602	Alloys used for special mixtures
	603	Annealing.
	604	Extra work.

some items which have to be split up between two or more departments. In these cases, the proper distribution should be noted on the invoice and entered in the proper columns.

Items which are not directly distributed to one or more of the four productive departments are charged to the proper general overhead account and allocated to the producing departments at the end of the period on the basis of the total payroll in each. Direct distribution of any item on the basis of estimated consumption is always more accurate than allocation on the basis of total payroll. It is therefore good policy to distribute directly as many items as possible, thus reducing to a minimum the amount of general overhead which will have to be allocated at the end of the period.

DETERMINING THE COST OF RAW MATERIALS AND SUPPLIES

There are three possible methods of obtaining the cost of any item of raw materials or supplies for any period; they are as follows:

(1) *Physical Inventory method*:

An actual physical inventory is taken at the beginning and end of the period. Actual consumption is calculated by adding the purchases to the beginning inventory and subtracting from this total the inventory at the end of the period.

(2) *Perpetual inventory method*:

All purchases are debited to a "stock account" and all requisitions are credited to the stock account and charged to the proper expense account. This method is often used for monthly records to avoid the necessity of taking monthly physical inventories.

(3) *Purchases charged directly to expense*:

This method is used for some items to save the clerical expense involved in taking physical inventories, keeping stock accounts and using requisitions. It is, of course, very inaccurate for monthly records because the actual consumption during any month of many items of raw materials and supplies may vary substantially from purchases, which are often made in large amounts sufficient for several months.

The methods used in any particular foundry for various items of raw materials and supplies will depend on the degree of accuracy desired by the management.

In the case of pig iron, scrap, and melting coke, these are such important items of cost that it is essential to use either the physical inventory or perpetual inventory method. It is also essential to keep accurate daily records of these items in order to get correct mixtures.

In the case of important supplies such as various types of sand, etc., it is also important to use methods "1" or "2" if accurate departmental cost statements are desired. A "short-cut" method which is often used by many foundries for molding sand, is to charge into each month's cost a certain amount per ton of good castings produced (based on the actual consumption of molding sand per ton of good castings produced for a previous period). A stock account is kept and the book inventory is adjusted periodically by a physical inventory.

In the case of other supplies, purchases should be charged directly to the expense account because the clerical expense involved in monthly physical inventories or

stock accounts and requisitions is too excessive. Where purchases are charged directly to an expense account, the cost of supplies on the monthly records will be substantially higher than actual consumption in some months and substantially lower in other months, and these variations must be taken into account in interpreting monthly departmental cost statements.

DISTRIBUTION OF PAYROLL

The distribution of the weekly payroll is greatly facilitated by giving all employees clock numbers which indicate their departments. For example, the clock numbers of all employees working in the melting department, can run from 100 to 199; molding department from 200 to 299 and so on.

Where practicable, it is good policy to carry this idea a step further by having clock numbers indicate not only the department but the account to which the employee's time should be charged. For example, the clock numbers of all molders, account "210" can run from 2100 to 2199; indirect laborers in the molding department, account "220", from 2200 to 2299 and so on.

The simplest way to get the total charge to any account for the week is to group together the names of all employees chargeable to the same account and merely add up the total earnings of these employees on the payroll record. This method can be used for any group in which all employees in the group stay on the same job in the same department all through the week.

Some of the employees are likely to shift from one department to another during the day or week. One of the following procedures may be used for distributing their time in these groups:

(1) If the employee customarily works all week in the same department, the total earnings can be merely posted to the proper cost centre.

(2) If the employee normally divides his time in certain regular proportions between certain departments, the earnings can be distributed by predetermined percentages.

(3) In the case of the employee whose shifts between departments are not in accordance with a regular pattern, it will be necessary to keep a daily record of the time, and the best way to do this is to use a weekly time card. The distribution of the time is entered daily on the time card either by the employee himself or by the foreman or a clerk. The distribution of the total earnings for the week is then posted to the proper account.

In carrying out the above procedures, the shop payroll has been completely distributed and the distribution is entered on a form similar to Exhibit 2. A line is used for each week's payroll distribution. At the end of the period the columns are totalled to obtain the distribution for the entire period.

The distribution of the office payroll is very simple, since this payroll covers only administrative and selling salaries, general supervision, and foremen's salaries. At the end of each month the total of the salaries to foremen is posted to the respective departments by percentages representing an estimate of the proportion of the time normally devoted to each department.

PREPARATION OF PRELIMINARY STATEMENT

If the preceding procedures have been followed carefully, any experienced book-

EXHIBIT 2

MONTHLY DISTRIBUTION OF SHOP PAYROLL

Week Ending	Total Shop Payroll	Melt Labor (120)	Mold Direct Labor (210)	Mold Indirect Labor (220)	Core Direct Labor (310)	Core Indirect Labor (320)	Clean And Ship Labor (420)	General Labor (518)

keeper should be able to prepare a preliminary statement showing each department's individual direct costs and the total direct cost within the department.

It is necessary to determine the total pounds of good castings produced during the period. The most accurate method is to take an inventory of castings on hand at the beginning and end of the period.

In small foundries, where casting inventories vary very little, it may be considered satisfactory to use shipments as production. However, if a foundry desires accurate monthly profit and loss statements or accurate monthly pound costs, it is essential to take monthly inventories of castings on hand. A rough approximate monthly inventory is far better than no inventory at all.

ALLOCATION OF GENERAL OVERHEAD EXPENSES

The bases of allocation used for the various general overhead expenses are as follows:

Expense	*Basis of Allocation*	*Unit*
1. Power and light	Estimated power consumption in each department	Horse Power Hours
2. Depreciation of equipment	Value of equipment in each department	Dollars
3. Depreciation of buildings Taxes Fire insurance	Floor space in each department	Square Feet
4. All other general overhead	Total payroll in each department	Dollars

It is not necessary to determine the power consumption, value of equipment, or floor space in other than the four main productive departments.

In each, determination of the figures for these four departments are added together and then each department's figure is divided by this total to get the percentage for that department.

A certain amount of time will, of course, be required to obtain the above data, but once these percentages have been determined they can be used for a considerable period of time. They should be roughly checked once a year, but no changes are likely to be needed unless there have been major changes in plant lay-out or equipment.

A rough approximate distribution of general overhead may be obtained by distributing the entire overhead on the basis of total payroll. This method is not recommended but may be used temporarily in some cases until the data on power consumption, value of equipment, and floor space in each department can be obtained.

RESERVE ACCOUNTS

There are certain items of expense, such as taxes, fire insurance, workmen's compensation insurance for which invoices may be received only quarterly or annually. If accurate monthly reports are desired, it is necessary to set up reserve accounts for these items and charge one-twelfth of the actual or estimated cost for the entire year. At the end of the year an adjustment is made for the difference between the estimated and actual annual cost.

Any bookkeeper should be familiar with the various methods commonly used in calculating depreciation. However, it should be noted that, in preparing cost statements for use in determining cost estimating formulas, the amount of depreciation included in the cost is not limited by the requirements of the Department of National Revenue, which must be strictly adhered to in preparing income tax returns. In preparing cost statements for its own use, a foundry can include any amount of depreciation that it thinks proper.

DETERMINATION OF DEPARTMENTAL RATES

When each department's total share of the general overhead has been obtained, a final statement is prepared from the preliminary statement by omitting all general overhead expense items (which have now been distributed to the departments), and adding each department's share of the general overhead to its total direct departmental charges. The sum of all the items on this final statement gives the total regular casting cost, and should be the same as the total of all items on the preliminary statement with the exception of the extra costs. (Series 600)

MONTHLY AND QUARTERLY COST RECORDS

Monthly cost reports are essential for effective cost control. However, it is not usually necessary to distribute general overhead and determine departmental pound costs and overhead rates monthly. A quarterly determination should be sufficient.

When monthly cost reports are prepared, a quarterly statement can easily be prepared from them by listing each monthly statement in successive columns on a sheet of columnar accounting paper, using a line for each account. At the end of the quarter, the total of each account for the quarter can be easily determined by adding the three monthly charges to the account.

Where monthly cost reports are not prepared, the distributions of the weekly payroll and distribution of purchases can be carried forward and do not have to be totalled until the end of the quarter. Instead of splitting payrolls and taking inventories at the end of each month, this has to be done only at the end of each quarter. This procedure saves some clerical expense but is not recommended, for it is essential, for proper cost control and profitable operation, that a foundry manager know his profit or loss monthly.

HOW TO USE THE COST SYSTEM

SYSTEMATIC ESTIMATING PROCEDURE

A systematic estimating procedure is one of the most important factors in profitable operation. An accurate up-to-date cost formula is essential, but in order to produce a profit equal to the established mark-up, it must be applied systematically to all jobs, so that every job will contribute its fair share of profit. This can only

be done by establishing certain estimating procedures which are rigidly adhered to.

It is the function of the cost department to provide management with correct cost figures showing actual departmental pound costs and overhead costs. It is the function of top management to determine estimating rates, based on these actual costs; to determine the mark-up which is to be added to job costs to establish selling prices; and to find a method of figuring job costs in order to determine charges for special equipment and subsequent processing. It is also one of the most important functions of top management to set up a systematic estimating procedure, so that the established pricing formula will be applied systematically to all jobs, and to see that this procedure is strictly adhered to.

DETERMINATION OF COST ESTIMATING RATES

Estimating rates should be based on the expected operating costs for the period during which the estimating rates are to be used. When costs are changing rapidly, this estimate should be based principally on actual costs for the preceding quarter, since cost levels in the preceding quarter will most nearly approach cost levels in the current quarter. However, costs for any one quarter are likely to be abnormal in some respects because, in that particular quarter, volume, purchases of supplies, repairs, or some other item may have varied substantially from normal usage. It is therefore necessary to compare costs for the preceding quarter with costs for the three prior quarters and with average costs for the preceding twelve-month period in order to locate abnormalities and prepare an adjusted statement of costs for the preceding quarter which will represent normal usage of supplies, repairs, and other items. An estimated statement of what costs will be for the current quarter can then be prepared on the basis of any anticipated increases in items such as wage rates, metal costs, etc. Estimating rates are determined by adding a reasonable margin of safety to these rates. 5% is a commonly used margin of safety. The amount should depend on the extent to which past actual realized profit percentages have approached estimated percentages. In order to simplify the figuring of job costs, it is best to use round figures, as far as possible, for estimating rates.

The estimation of future normal operating costs and determination of estimating rates as described above require the best judgment of all branches of management. The final decision should be made by the general manager after consultation with the cost accountant, the sales manager, and the superintendent.

During periods when costs are changing rapidly, estimating rates should be checked and revised at least quarterly, or more often if necessary.

DETERMINATION OF MARK-UP

Since it is customary to judge the profit of a business by its earnings in percentage of sales and since the only profit which a business retains is the profit after payment of income taxes, the first step should be to decide what percentage of profit on sales after income taxes is desired. This decision is solely the function of each foundry's management.

Mark-up should always be designed to cover profit only. When this policy is followed, a comparison of actual realized profit percentage at the end of the year with estimated mark-up provides a valuable check on the effectiveness of the cost and estimating procedure. For this reason it is bad practice to use a mark-up which

is supposed to cover, in addition to profit, any cost factors such as administration and selling expense, or extra costs not shown up by the regular cost formula. If there are any hidden costs, such as extra cleaning costs or abnormally high rejections it is better to estimate them and add them to cost rather than to vary the mark-up to cover them.

EXAMPLE OF A JOB COST ESTIMATE

The estimating rates determined in Exhibit 3 were as follows:

Metal melted	4.2 cents per lb.
Mold overhead	260% of mold direct labor.
Core overhead	210% of core direct labor.
Clean and ship cost	2.0 cents per lb.

Assume that current wage rates for molders and core-makers are $1.50 per hour.

For a particular casting the job cost data have been found to be as follows: Weight—50 lbs. each; 1 core; 1 casting per mold; 1 molder produces 16 molds per 8-hr. day; 1 coremaker produces 6 cores per hour; and the estimated scrap loss from defective castings is 10%.

From the above data, the cost of this casting is calculated as follows:

Melted metal—50 lbs. @ 4.2¢	$ 2.10
Mold direct labor—$12.00 divided by 16	.75
Mold overhead—260% of $ .75	1.95
Core direct labor—$1.50 divided by 6	.25
Core overhead—210% of $ .25	.53
Clean and ship cost—50 lbs. @ $ .02	1.00
Total cost without loss	6.58
Defective loss—10% of $6.58	.66
Cost per casting F.O.B. foundry	$ 7.24
Cost per lb.—$7.24 divided by 50	14.48¢

VARIOUS METHODS OF FIGURING JOB COSTS

The cost of a job may be estimated by estimating each item of cost expressed as:

(1) Cost per piece.
(2) Cost per mold.
(3) Cost per day's work.
(4) Cost per pound, and,
(5) Cost per hundredweight.

A foundryman may use any procedure he prefers. However, there is a definite advantage in expressing the various items in cost per pound, for when this procedure is used, the cost per pound of any job for mold or core direct labor can be compared directly with the same items in the cost of any other job or in average shop operating costs. This gives any job cost estimate a significance which it would not have if the items of cost were expressed in any other unit, except cost per hundredweight, which may be preferred by those who are accustomed to thinking of cost on pricing castings in terms of cost or price per hundred pounds.

EXHIBIT 3

SUMMARY OF DEPARTMENTAL COST AND COST FORMULA

	Total Cost	Cost Per Lb.	Actual Rates	Estimating Rates (Cost Formula)
Melted metal	40,498.	4.05c.	4.05c.	4.20c.
Mold direct labor	14,900.	1.49		
Mold overhead	36,998.	3.70	248%	260%
Core direct labor	4,800.	.48		
Core overhead	9,612.	.96	200%	210%
Clean and ship cost	18,602.	1.86	1.86c.	2.00c.
Total regular cost	$125,410.			
Average cost per lb.		12.54c.		

JOB COST CARDS

Printed job cost cards are essential for effective estimating. These cards cost very little and can be secured from any printer. A suggested form of job cost card is illustrated in Exhibit 4. The form illustrated should be suited for many foundries, but the form can be varied to suit individual requirements. These cards should be kept in a separate file cabinet, filed by customer and pattern number.

CHARGES FOR SPECIAL EQUIPMENT

When specal equipment is purchased outside, a handling charge should be added, usually on a percentage basis of cost determined from suppliers' invoices.

When made by the foundry, cost should include material and direct labor. An adequate percentage of direct labor to cover departmental overhead and mark-up should be determined in the usual manner.

It is the best policy to make a separate charge for special equipment, but where it is preferred to include the charge for the special equipment in the casting price, the proper procedure is to determine the charge and divide it by the total pounds of castings on order, and add this price per pound to the pound price of the castings.

COST CONTROL

A cost system has three functions:

(1) Cost estimating to enable the manager to estimate the cost of individual jobs and therefore to establish prices which will yield a fair profit.

(2) Cost control of operating departments to provide the manager with monthly cost records which will enable him to control effectively operating costs of all production departments.

(3) Cost control of individual jobs to locate jobs that are running high in cost and to take the necessary steps to correct same.

Monthly profit and loss statements and cost reports enable a manager to know his profit position every month so that he can take prompt action to stop adverse trends before they have gone too far. When cost is broken down into the departmental and general cost accounts the value is increased tremendously.

The cost per pound of any item is a much more valuable index of efficiency than the cost in dollars. An increase in dollar costs may be due merely to an increase in volume, but any substantial increase in the cost per pound of any item may be an indication of inefficiency and deserves investigation. It is therefore essential, for effective cost control, to have monthly cost reports which show the cost per pound of each item.

The most valuable type of monthly cost report is one in which each month's cost is shown in parallel columns. There should be two such reports, one expressed in dollars and the other in cents per pound.

CONCLUSION

The demand for the products of the iron foundry industry increased so rapidly during the past half century that foundry operations were enlarged and new operating techniques were developed to supply the increased demand for the raw material, gray iron. The fluctuations in economic conditions during this part of the century

JOB COST CARD

EXHIBIT 4

		Estimated	Actual	Variance	
				Favourable	Unfavourable
Customer	Date				
Pattern No.	Quantity				
Description	Melted metal @				
Class	Mold direct labor				
Pattern equipment	Mold overhead @				
Weight	Core direct labor				
No. per mold	Core overhead @				
Weight per mold	Clean and ship @				
No. of cores	Total Loss @				
Mixture No.					
Mold in hours	Cost F.O.B. Foundry Delivery @				
Core per hour	Total delivered cost Mark up @				
	Figured price per lb.				
	Price quoted per lb.				
	Price quoted per piece				

created an awareness of the need for constant control of costs in all phases of the industry.

It is vital to the success of every foundry that it install and operate a practical and workable cost acounting system which is easy to understand, to set up, and to use at a nominal clerical expense.

For further reading

BASIC COST SYSTEM FOR GRAY IRON FOUNDRIES, Cost Manual No. 1, Gray Iron Founders' Society, Inc., Cleveland, Ohio.

PRACTICAL COST CONCEPTS FOR SMALL AND MEDIUM SIZED FOUNDRIES, by A. C. Sinnett, N.A.A. Bulletin, Sept. 1959.

RAW MATERIAL COST CONTROL IN A GRAY IRON FOUNDRY, by Thomas B. Noble, N.A.A. Bulletin, Sept. 1957.

PERSONALS

B. D. CROOKES, C.A., R.I.A., Secretary-Treasurer of Commonwealth Construction Company Ltd., has been appointed to the Board of Directors of the Company. Mr. Crookes is a member of the Winnipeg Chapter of the Society.

C. S. WALKER has been appointed Secretary-Treasurer of Parmenter & Bulloch Manufacturing Co. Ltd., Gananoque, Ontario. Mr. Walker was formerly Assistant Treasurer of the Company.

A. P. BARRY, formerly General Accountant with Canadian Locomotive Co. Ltd., Kingston, Ontario, has been appointed Manager of Accounting of the Company. Mr. Barry is a General Member of the Kingston Chapter.

J. R. MATTESON, R.I.A., of the Hamilton Chapter, has been appointed Comptroller of Halco Construction Co. Limited. Mr. Matteson was formerly with Wright, Erickson Lee & Co. in Hamilton.

L. P. DUCHAINE, R.I.A., C.G.A., L.I.C., President of Ludger Duchaine, Inc., has been nominated a Director of La Compagnie Paquet Limitée. Mr. Duchaine is Honorary-Treasurer of the Canadian Society.

ANDRÉ BARNARD, B.SC., a General Member of the Quebec Chapter, has been nominated a Director of La Compagnie Paquet Limitée. Mr. Barnard is with the Quebec Government.

LÉANDRE FAGUY, M.S.C., has been appointed Treasurer of L'Association des Licenciés en Sciences Commerciales de Laval Inc. Mr. Faguy is a Vice-Chairman of the Quebec Chapter.

GEORGES LACHANCE, C.A., R.I.A., Chairman of the Quebec Chapter, has been appointed a Director of the local chapter of the Institute of Chartered Accountants of Quebec.

CAMILLE BLIER, B.A., M.S.C., a Director of the Quebec Chapter, has been appointed a Director of the local chapter of the Institute of Chartered Accountants of Quebec.

K. C. FINCHAM, B. COM., C.A., has been appointed Assistant Comptroller of Revenues of the Canadian National Railways. Mr. Fincham, a General Member of the Montreal Chapter, lectures in Accounting at McGill University.

Books in Review . . .

MANAGERIAL ACCOUNTING—AN INTRODUCTION

By Harold Bierman, Jr., MacMillan Company, New York. Distributed in Canada by Brett-MacMillan Ltd., Galt, Ontario. 1959. pp. 483 including index. $10.00.

REVIEWED BY GEORGE MOLLER, D. JUR., C.A., R.I.A.

It is a pleasure to welcome this long-overdue book to the management accountant's library. Professor Bierman (Cornell University) fills a real need by setting out in brief, clearly-written chapters all that is needed "to acquire a basic understanding of accounting." As the Preface indicates, bookkeeping techniques, accounting systems and procedures for handling paper and auditing have been de-emphasized in this text. On the other hand, such items as the limitations of accounting, the accounting cycle, the flow of costs, compound interest, annuities and related accounting problems, inventories and a changing price level, and common dollar accounting are well treated.

Managerial Accounting is interlaced with questions and problems which should make it useful as a standard text for commerce and finance students and/or professional managers without specialized accounting training. Quoted here at random are a few significant sentences from the introductory chapter in which the author seeks to prove why accounting should be included in the curriculum for non-accounting majors:

> "Accounting is the language of business and thus is the primary means of communicating business data."
>
> "Accounting may also be useful for developing a person's logic."
>
> "Accounting will help teach that problems may be solved in a logical systematic manner. If this skill in problem solving can be transferred to other areas, the study of accounting will have value as a training device as well as the inherent value it has as a means of communication."

The author distinguishes between "private accounting" and "public accounting", stating that the private accountant is hired by a firm engaged in manufacturing, merchandising, etc. and is actually in the employ of the firm for which he is rendering the service. "The controller of a large corporation is a private accountant, as is a payroll clerk." The latter statement will, by the way, bring Professor Bierman into conflict with staunch proponents of the specific concept of controllership such as James Peirce.

The first part of the book, "Financial Accounting", tells the reader everything which the non-accounting executive needs to know about the way accounting data for financial statements are collected, sorted, recorded, grouped and presented. The three basic statements, the position statement (a term used by the author for the balance sheet), the income statement and the fund statement are explained and their significance evaluated. The main ratios useful to management are described. Some unusual and descriptive terms are used, such as "income-position statement ratios", "all-asset earning rate" for what is normally termed "return on capital employed", and "stock-equity earning rate'" for "the return on investment".

The second part of the book, "Managerial Accounting", is in fact an introduction to the fundamentals of advanced cost accounting.

Brief but complete chapters are devoted to the analysis of cost variances, the administration of the budget program, direct costing, marginal and differential costs and decision-making, break-even analysis and, most important, measuring performance. The latter chapter is, to the reviewer's knowledge, the first attempt to treat this vital application of accounting in an introductory text. Understandably, the author does not go into details, but succeeds well in presenting the facets of this application. Chapter 32, "Accounting Reports for Management", outlines in ten pages the essential principles of controlling accounting reports for management. It is gratifying to see that the chapter on capital budgeting includes a discussion of the time shape of cash proceeds and stresses the problem of uncertainty in all calculations underlying the decision-making process. This chapter even includes a short review of the rate of return approach and income taxes, illustrated by example.

It is rarely that this reviewer is able to endorse a new text book without reservations. Bierman's *Managerial Accounting* certainly deserves this sincere recommendation. It should appeal to students of business administration, commerce and finance, or economics, who are not specializing in accounting. It should appeal especially to the non-accounting executive who wants to acquire an independent knowledge of the basic principles of financial and cost accounting and their application in the management of industrial enterprises, including the control of operations and decision-making.

Those who study this text will gain an individual insight into the complexities of this field that will free them from complete dependence upon the explanations of their financial officers. *Managerial Accounting* should also have an excellent application as a text book supporting a course or seminar on accounting for non-accounting executives.

Books Added to Library...

Title	*Author*	*Publisher*
Accounting—A Management Approach (Revised Ed.)	Hill and Gordon	Richard D. Irwin
Fundamental Accounting Principles (Revised Ed.)	Pyle and White	Richard D. Irwin
Decision Making and Productivity	Melman	John Wiley & Sons Inc.
Financial Organization and Management (4th Rev. Ed.)	Gerstenberg	Prentice Hall
Management for the Smaller Company		American Management Assc.
Men Who Manage	Dalton	John Wiley & Sons, Inc.
Organizing and Financing Business (6th Edition)	Bonneville, Dewey and Kelly	Prentice Hall
Policy Formulation and Administration (3rd Ed.)	G. A. Smith and C. R. Christensen	Richard D. Irwin

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Taxes on Income and the Upward Force, H. E. Crate, May pp. 204-208.

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